

Subject: Mathematics

Grade: Eighth

Standard: #5 Geometry

Key Concept: Use geometric ideas to describe things in nature, art, construction, and other areas.

Generalization: Students relate geometrical transformations to the real world.

Background:

This lesson would be appropriate as a culminating activity for a unit on geometry. Students should have studied two- and three-dimensional shapes, as well as perimeter, area, volume, and circumference.

Students choose a tier according to interest in a structure. Three excellent books by David Macaulay to have students choose from are Cathedral, ISBN# 0-395-31668-5, Pyramid, ISBN# 0-395-32121-2, and Castle, ISBN# 0-395-32920-5. You may know of other books which describe the construction of bridges, sky scrapers, etc. which would also be appropriate. A selection of books at a variety of reading levels may be necessary.

Students may work individually or in teams of two or three. Each tier will read the book and select a product to make which will illustrate at least five geometric ideas found in the book. Students may choose to build a replica of the structure, make a scale drawing of the structure, make a compare and contrast chart of the structure in the book and a familiar recent day structure, poster, wall hanging, or quilt design. You may want to limit the number of different products which students can choose. Every student will write a 2-3 page report which explains the geometric ideas they have chosen to illustrate in the product made by their tier.

This lesson is tiered in *content and product* according to *interest*.

Tier I: *Cathedral*

Tier II: *Pyramid*

Tier III: *Castle*

Tier IV:     *Sky Scraper*

Assessment:

For each product a rubric could be prepared or a general rubric based primarily on creativity, neatness, and accuracy of the geometric ideas could be used for all the products. The written report rubric should include points for spelling, grammar, neatness, and correctness of the facts. Rubrics should be given to the students before beginning the lesson.